

Petro-Canada Lubricants

Mississauga, Ontario

“As a world class supplier of quality lubricants, Petro-Canada Lubricants is always looking for opportunities to reduce its operating costs to gain a competitive advantage in a dynamic marketplace. The Green Industrial Analysis helped us to identify energy, water, and resource opportunities within our facility, and has provided us with valuable direction and recommendations that will enable us to focus on programs and initiatives to capture significant reductions and savings.”

R.T. Ives, P.Eng.
Manager
Reliability and Technical Support
Petro-Canada Lubricants

THE COMPANY

Petro-Canada Lubricants is a manufacturing facility of the well-known major Canadian integrated oil company. In the 1940's, the British American

Oil Company built this facility as the Clarkson Refinery, an integrated oil refinery, producing a wide variety of fuels and other products. During the 1980's, Petro-Canada purchased from other companies the Mississauga Refinery and a refinery in Oakville, 8 km away. Petro-Canada converted the Mississauga Refinery into a manufacturing centre for lubricating oils and greases, using feedstock from the Oakville Refinery. Currently, the Mississauga Lubricants Centre employs 420 people, and produces about 8,000 barrels (1.3 million litres) per day of lubricants which meet a wide range of specifications. Petro-Canada ships these products to domestic and international markets.

THE CHALLENGE

Although the primary fuel is natural gas, Petro-Canada Mississauga still consumes heavy fuel oil, some of which is produced by the Oakville Refinery. Heavy fuel oil is a valuable

product, with a ready market among electric utilities in the USA. The other fuel is refinery fuel gas, a byproduct of refinery operations. Mississauga's refinery fuel gas is rich in valuable hydrogen gas.

Petro-Canada Lubricants receives vacuum gas oil from the Oakville Refinery. The vacuum gas oil is refined into lubricating oil stock by hydrotreating, a process which is unique to Canada. The gas oil reacts with hydrogen gas at high pressures and temperatures. The products of the hydrotreating unit are distilled to separate lube oil components from other hydrocarbons. This distillation process releases valuable byproducts: hydrogen, propane, and butane, which are currently burned in the refinery fuel gas system.

The conversion of a 70,000 barrel (11,100 m³) per day integrated oil refinery into a 12,000 barrel (1,900 m³) per day lubricants plant created inefficiencies in the use of utilities and



Petro-Canada's Mississauga Lubricants centre.

equipment. Pumps and utility systems which had been designed for the large integrated refinery were now operating in the smaller lubricants plant at lower output, with greatly reduced efficiency. The refinery steam system also contained many malfunctioning steam traps, and was no longer balanced among the various pressure levels needed to generate mechanical power and to provide heat for refinery processes.

OPPORTUNITIES

Petro-Canada Lubricants presented valuable opportunities to reduce, reuse and recycle fuels, electrical energy, refinery intermediates, cooling water and operating costs. How could Petro-Canada realize these opportunities? In 1995, the Ministry of Environment and Energy and Petro-Canada retained the services of Kilborn Inc., of Toronto, for a Green Analysis, to study these opportunities.

RECOMMENDATIONS

The Final Report of the Green Analysis of Petro-Canada Lubricants included 23 recommendations. Here are the 5 most important recommendations:

- ✧ recover useful hydrogen, propane, and butane from the refinery fuel gas stream.
- ✧ reduce venting of surplus steam through the deaerator.
- ✧ implement a steam trap maintenance and repair program.
- ✧ use new steam turbines, to produce useful power, replacing pressure reducing valves.
- ✧ pre-heat boiler feed water with waste heat from process units.

The Final Report identified recovery of saleable hydrogen, propane, and butane, as an opportunity for business development.

PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies doing business in Ontario may seek ministry/industry services that will help them to:

- ✧ use energy and water more efficiently;
- ✧ reduce, reuse and recycle solid waste;
- ✧ reduce or eliminate liquid effluents and gaseous emissions.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.

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MINISTRY OF ENVIRONMENT AND ENERGY SERVICES

For information on Ministry of Environment and Energy assistance to industry, please contact the Industry Conservation Branch at (416)327-1492, Fax (416)327-1261.

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This project profile was prepared and published as a public service by the Ontario Ministry of Environment and Energy. Its purpose is to transfer information to Ontario companies about findings and recommendations of a resource conservation and environmental analysis conducted by a consulting engineering firm at an industrial plant in Ontario.

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